"Empowering Cosmetic Science"
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Evaluating The Efficacy Of Glutamate Amino Acid Surfactants And Encapsulated Salicylic Acid In Acne Cleansers: A Clinical Study On Sensitive Skin

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- Cleanser on acne skin
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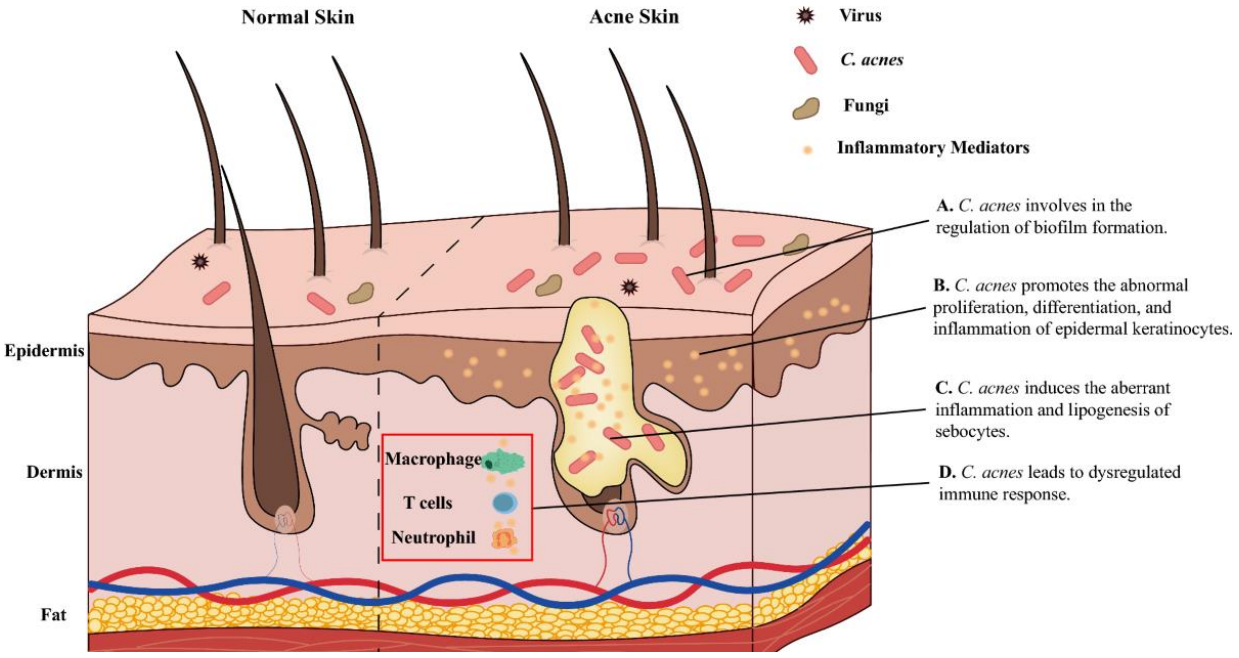
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INTRODUCTION



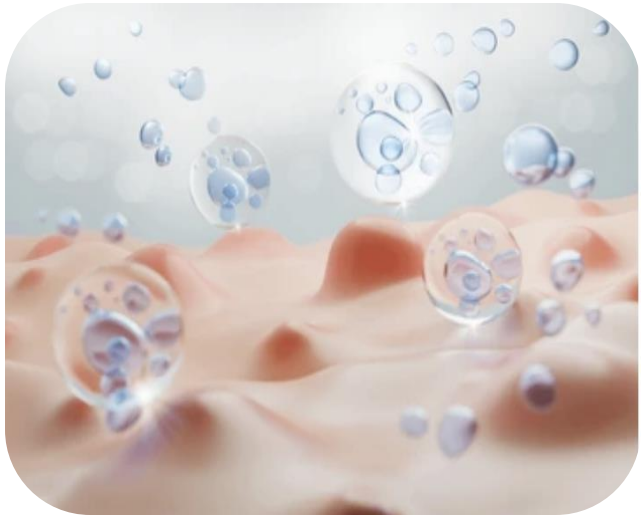
Acne vulgaris is different with normal skin and becomes particularly complex in individuals with sensitive skin



Acne sensitive skin symptoms[1]

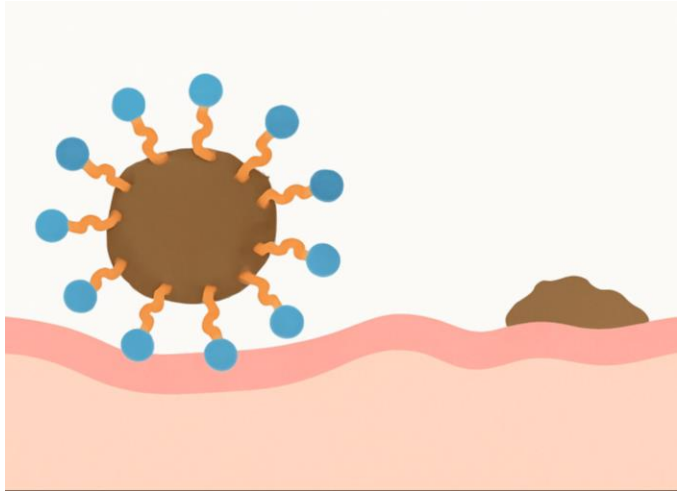
- Imbalance skin microbiome
- Prone to irritation and inflammation
- Higher TEWL
- Sensitive to redness, burning, itching

INTRODUCTION



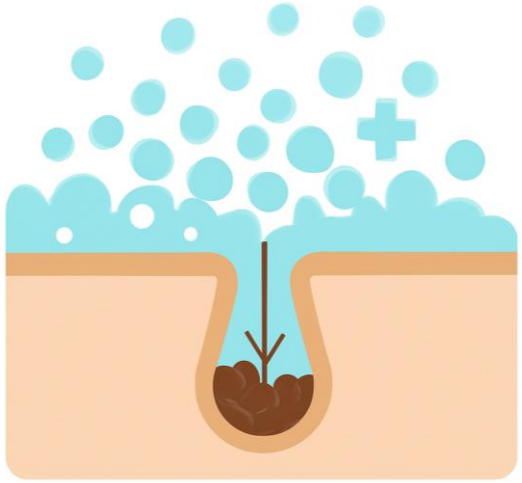
Cleansing on acne skin[2, 3]

- prepare for topical treatments
- support skin barrier function,
- non-comedogenic, non-acnegenic,
- maintain physiological pH, and
- reduce *C. acnes* inflammation



Surfactants mechanism

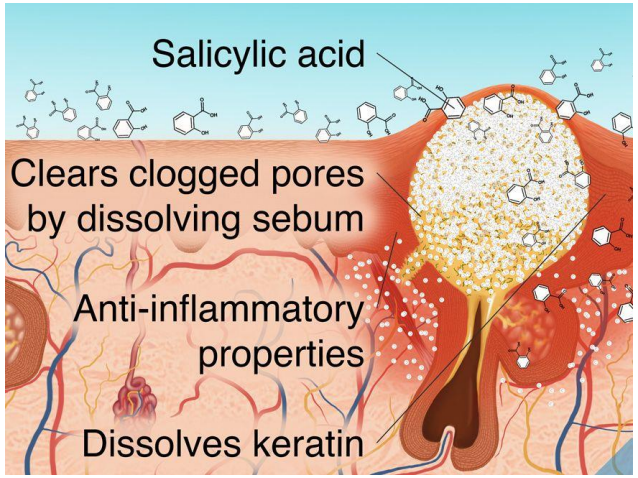
- dissolve hydrophobic substances
- unable to differentiate lipophilic intercellular lipids and lipophilic skin soils[4, 5]



Mild surfactant

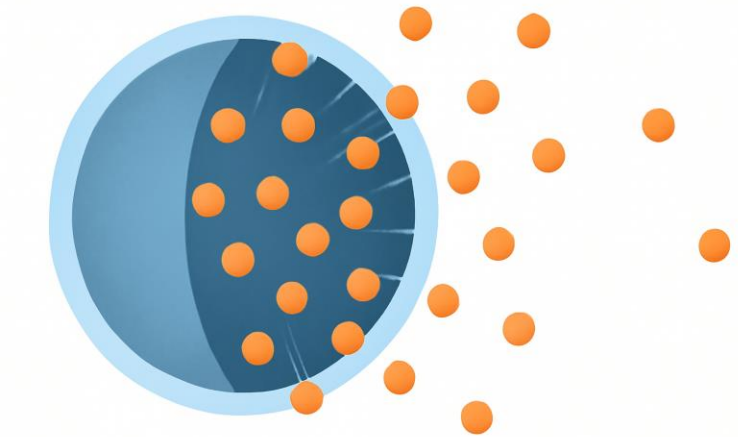
- amino acid–based surfactants: are low toxicity, high biodegradability, and sustainability
- glutamate amino acid surfactant can effectively remove dirt from the skin while preserving essential components of the skin barrier

INTRODUCTION



SA Conventional

- SA: topical agent for acne treatment due to its keratolytic, comedolytic, and anti-inflammatory properties
- Several adverse effects: include prolonged erythema, dryness, and excessive desquamation[6]



Encapsulated SA

- Reduce potential for irritation,
- Maintain the stability and pH compatibility
- Preserve the chemical integrity of SA

OBJECTIVE

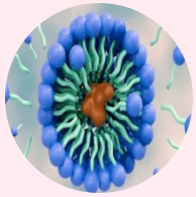
"This study aims to evaluate the efficacy and tolerability of a mousse-type facial cleanser formulated with glutamate-based amino acid surfactants and encapsulated salicylic acid in the treatment of acne vulgaris in individuals with sensitive skin"

MATERIALS & METHODS

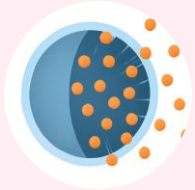
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Formulation Materials



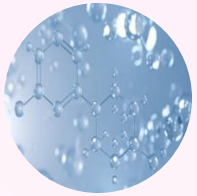
10% active Disodium Cocoyl Glutamate (DCG) and Cocamidopropyl Betaine (CAPB)



0.5% Encapsulated Salicylic Acid (ENSA)



bifida ferment lysate



humectants and allantoin

Formulation Testing

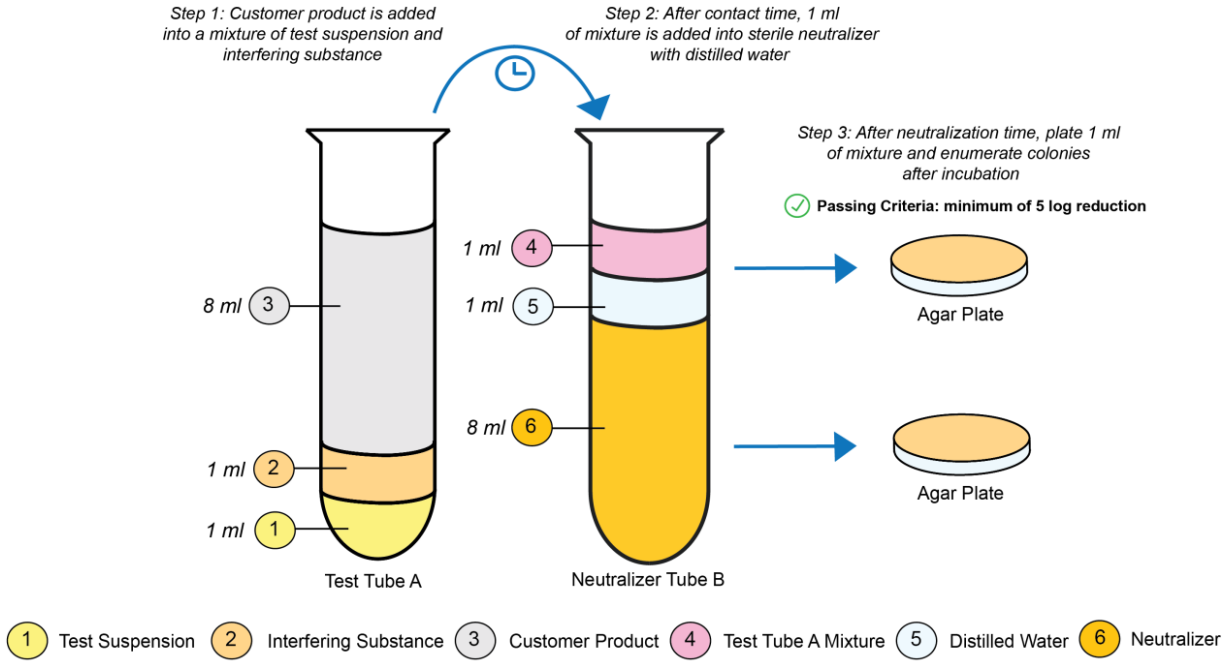
- pH
- foam size used Keyence VHX-7000 microscope
- Stability test: room temperature, display, freezer (-4°C), sun exposure, and in ovens at 45°C and 50°C.





MATERIALS & METHODS

Kill Test on *C. acnes*



Microorganism: *C. acnes*; **Contact time :** 30 & 60 seconds;
Method : SNI EN 1276:2019

Microbiome Friendly Test on Acne Regime Products



n=35 female
acne sensitive skin



7-day washout (Day 0)



14-day product usage of acne care regimen
(Day 14)



DNA extraction – NGS analysis



Microbiome analysis

MATERIALS & METHODS

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Safety Test

SPT	HRIPT	Ophthalmologist test
9 days 24 Subject	4 phase 40 subjects	28 days 22 subjects
Irritation Score	Irritation Score	TBUT Ocular Compatibility



Clinical Study

- 63 females-acne sensitive
- Twice daily, 14-day period

Dermatologist evaluation	Instrumental (Tewameter, Courage Khazaka, VISIA)	Questionnaire

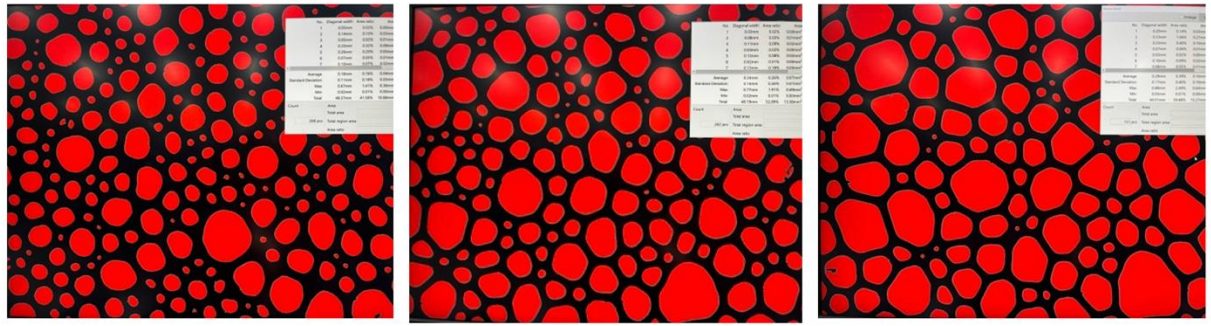
RESULTS & DISCUSSIONS

Foam appearance captured by camera digital



0 minutes | 5 minutes | 10 minutes

Foam appearance analyzed by Keyence VHX-7000 microscope



0 minutes | 5 minutes | 10 minutes

Foam performance and size of the facial cleanser

The average diameter size analyzed using Keyence microscope was measured at 0 minutes (0.18 μm), 5 minutes (0.24 μm), and 10 minutes (0.29 μm)

- pH of the product: 4.5 – 5.5
- Remain stable on accelerated (3 months oven) and long-term condition (1 year room temperature)
- Foam size ranges (0.18-0.29) μm

- pH of the products have an impact on the skin and prevented *C. acnes* from growing excessively on physiological skin pH (4.0–6.5)[3]
- CAPB and DCG form mixed surfactant films and enhanced intermolecular interactions, increasing foam film elasticity resulted creamier and long-lasting foam[7]
- Mousse-foam type create a cushioning effect that significantly reduces friction during application, minimizes mechanical irritation and inflammation.

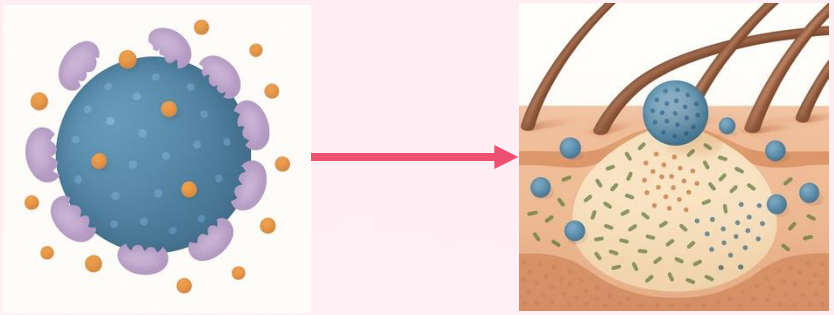
RESULTS & DISCUSSIONS

Kill test effectiveness of the facial cleanser on *C. acnes*

Contact time (s)	Total of bacteria (CFU/ml)		log reduction	Kill percentage
	Before	After		
30	1.5×10^7	2.3×10^2	4.81	>99.998%
60	1.5×10^7	<140	>5.03	>99.999%

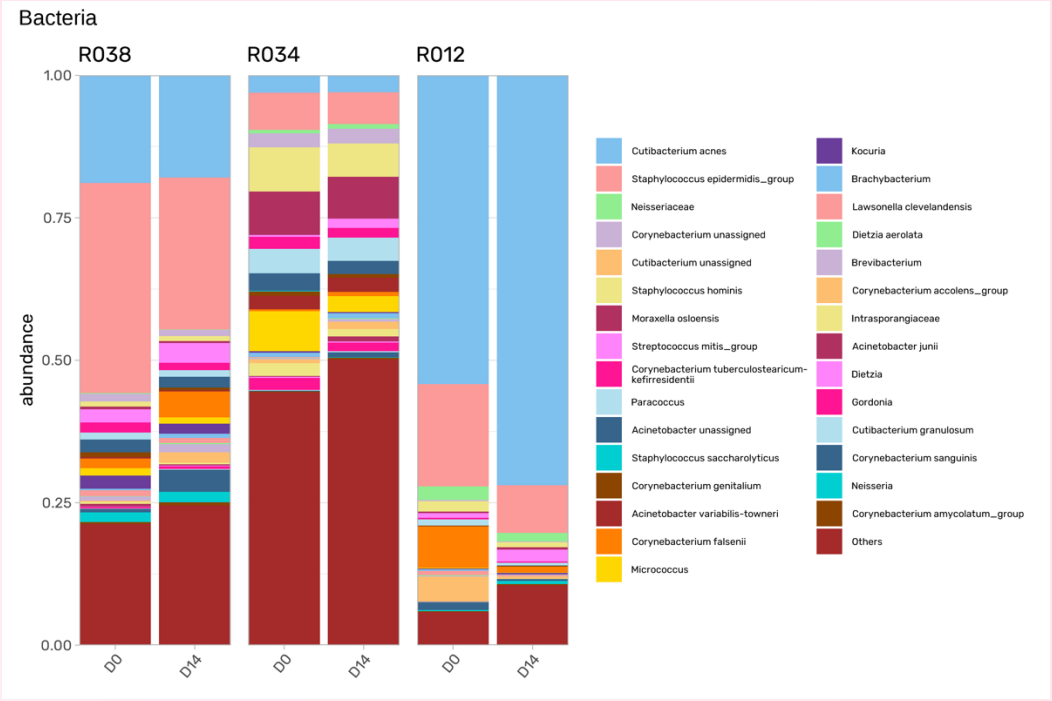
- minimum contact time of **60 seconds during cleansing** is recommended to maximize the product's efficacy

Illustration of ENSA in the product



- Ensures targeted delivery of the ENSA while minimizing irritation
- ENSA not only preserves the therapeutic benefits of SA but also enhances skin tolerability through sustained, site-specific release.

Microbiome test for acne regimen



Changes in skin bacterial composition between Day 0 (D0) and Day 14 (D14) for three representative individuals

- the acne regimen products did not significantly alter the microbial balance of the skin, suggesting that the products are microbiome-friendly

RESULTS & DISCUSSIONS

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Safety Evaluation Parameter

Dermatologically tested

Hypoallergenic - 0 subject showed any sensitization potential

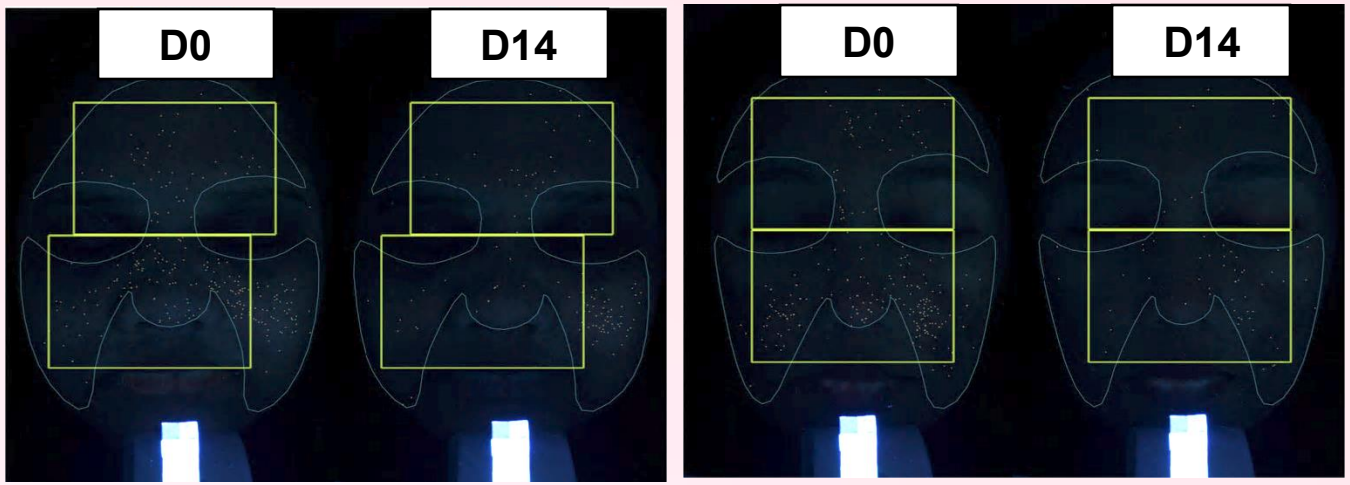
Non-irritant formula - Irritation Score 0.00

Opthalmologically tested - maximum score in global ocular compatibility (4.0 ± 0.0)

Acne Improvement Parameter

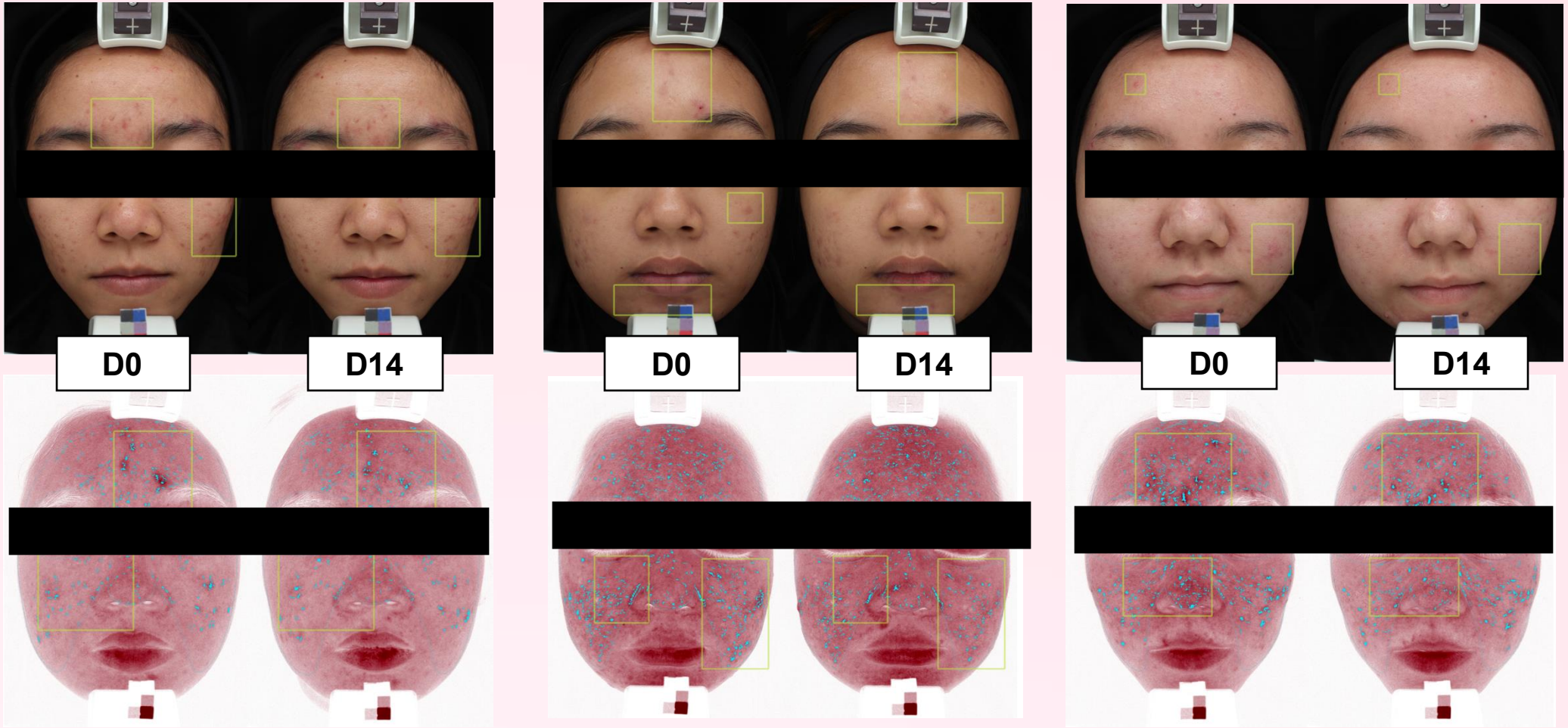


Reduction in acne lesion size after 14 days of application (-84.48%, $p<0.05$) based on dermatologist evaluation



Reduction in skin porphyrins by VISIA skin analysis

RESULTS & DISCUSSIONS



Skin improvement condition

- Images showed reduction in redness, fewer acne lesions, and a brighter skin appearance
- This study shower reduction of TEWL (-25.33%, $p<0.05$) from 14.32 g/m²/h at D0 to 10.69 g/m²/h at D14
- Acne patients had a significantly higher mean TEWL of 13.16 g/m²/h compared to 10.63 g/m²/h in normal controls[8]

RESULTS & DISCUSSIONS

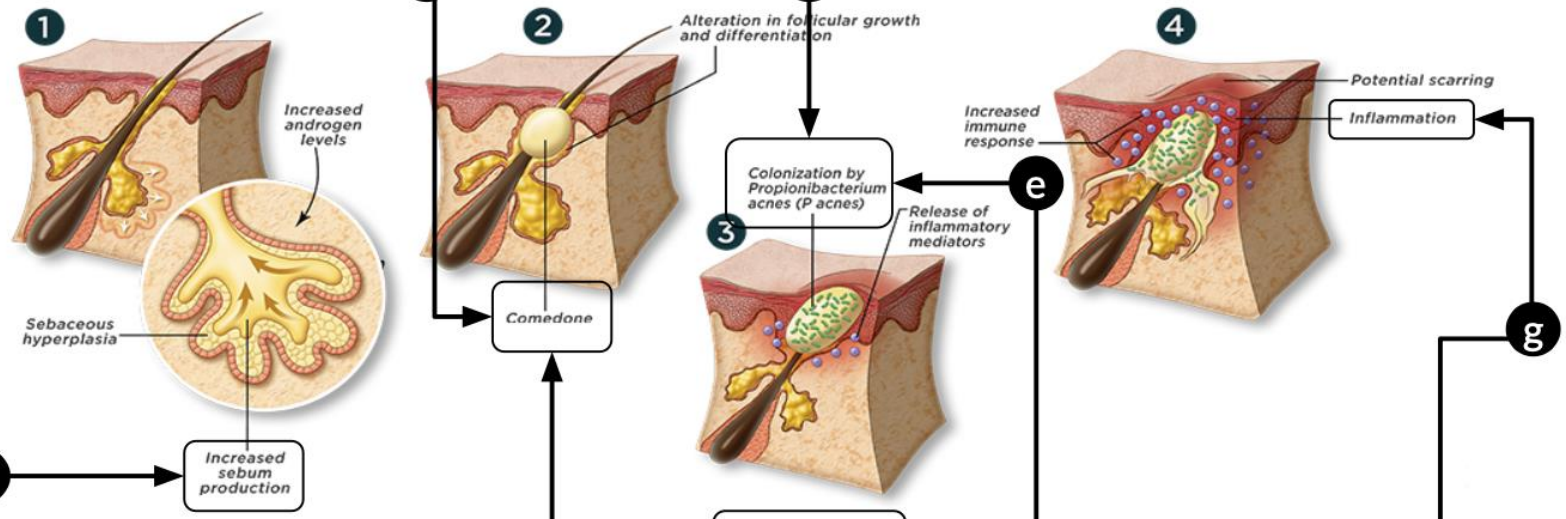
- **Disodium cocoyl glutamate (DCG) cleanses the skin effectively without compromising the skin barrier**, and unlike traditional harsh surfactants such as sodium lauryl sulfate, it exhibits excellent skin compatibility, as they cleanse without stripping away essential lipids or disrupting the skin's acid mantle[4]. This characteristic was reflected in the results of the subject questionnaire, **in which >80% participants reported that the cleanser did not leave their skin feeling stripped or tight**
- In this study, we have shown that facial cleanser formulated with **ENSA not only reduce acne lesion size but also help maintain a healthy skin microbiome**, indirectly contributing to the reduction in porphyrin-producing bacteria such as *C. acnes*.
- Additionally, bifida ferment lysate as a **microbiome-active ingredient helps balance the skin microbiot**a, disrupt acne biofilm formation, and soothe inflammation, as **indicated by reduced redness and improved skin appearance** shown by VISIA skin analysis. By modulating the skin microbiome, these actives help in reducing inflammation and preventing the proliferation of pathogenic bacteria[9]

RESULTS & DISCUSSIONS

Mechanism action of the product

Encapsulated Salicylic Acid
An innovative micro encapsulated of salicylic acid (SA)

c. Sustain released to unclog pores by removing dead skin cells, comedones
d. Works targeted on *C. acnes*



Amino Acid Mousse Foam
A natural and mild-to-skin surfactant with micro foam size to deeply clean pores with minimal hand friction on acne

a. Cleanse the dirt, residue & excess sebum on skin
b. Removes comedones

Microbiome Active
Specific Microbiome Technology for acne prone sensitive skin

e. Balancing skin microbiome
f. Removes & prevent acne biofilm
g. Soothe skin inflammation by reducing redness

CONCLUSION

- The mousse-type facial cleanser formulated with the mild amino acid surfactant disodium cocoyl glutamate (DCG), encapsulated salicylic acid (ENSA), and bifida ferment lysate demonstrated significant efficacy in improving acne-prone sensitive skin conditions
- The product claimed to be non-irritant, hypoallergenic, and ophthalmologically tested
- The use of a mousse foam and DCG surfactant ensured effective cleansing and less friction without compromising the skin barrier.
- ENSA provided targeted anti-acne activity with controlled release, minimizing irritation while reducing acne lesion size. Additionally, bifida ferment lysate supported skin microbiome balance and barrier repair.
- This synergistic formulation led to a significant decrease in TEWL by 25.33%, indicating enhanced barrier function and reduce acne size by 84.48%
- VISIA skin analysis further supported these findings, showing visible reduction in porphyrin levels, and skin redness after 14 days of use, along with overall improvement in skin tone and clarity.

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